Name: Date:

Polynomial Factoring solution (version 656)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 6x + 21 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(1)(21)}}{2(1)}$$

$$x = \frac{-(6) \pm \sqrt{36 - 84}}{2(1)}$$

$$x = \frac{-6 \pm \sqrt{-48}}{2}$$

$$x = \frac{-6 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{-6 \pm 4\sqrt{3}\,i}{2}$$

$$x = -3 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 + 6i$ and $7 + 5i$ in standard form $(a + bi)$.**

Solution

$$(-2 + 6i) \cdot (7 + 5i)$$

$$-14 - 10i + 42i + 30i^2$$

$$-14 - 10i + 42i - 30$$

$$-14 - 30 - 10i + 42i$$

$$-44 + 32i$$

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3. **Write function $f(x) = x^3 - 9x^2 + 20x - 12$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	-9	20	-12
6		6	-18	12
	1	-3	2	0

$$f(x) = (x-6)(x^2 - 3x + 2)$$

$$f(x) = (x-6)(x-1)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+8)^2 \cdot (x+5)^2 \cdot (x+1) \cdot (x-2)^2$$

Sketch a graph of polynomial $y = p(x)$.